

CLAIMS

1. A method of removing moisture from a material comprising the steps of: heating a first stream of gas using a heater, passing said
5 stream of heated gas through a dryer, to extract moisture from said material contained within the dryer; returning a first portion of the used gas, which constitutes a second stream of gas, from an outlet of the dryer to the heater; re-heating the second stream of gas in the heater; and passing the heated second stream of gas back into the dryer, wherein the first stream
10 of gas is atmospheric air from which at least a proportion of the nitrogen present therein has been removed, to thereby increase the percentage by volume of oxygen in the first stream of gas.
2. A method as claimed in claim 1, wherein at least 50% of the
15 nitrogen normally present in atmospheric air is removed.
3. A method as claimed in claim 2, wherein at least 97% of the nitrogen normally present in atmospheric air is removed.
- 20 4. A method as claimed in claims 1 to 3, wherein a proportion of the nitrogen normally present in atmospheric air is removed resulting in the first stream of gas containing between 90% and 99% oxygen.
5. A method as claimed in claim 4, wherein a proportion of the
25 nitrogen normally present in atmospheric air is removed resulting in the first stream of gas containing 90% oxygen.
6. A method as claimed in any one of claims 1 to 5, further comprising the step of expelling a second portion of the used gas at or
30 above atmospheric pressure through a heat recovery system before gas treatment and/or exhaust to the atmosphere.

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7. A method as claimed in any one of claims 1 to 6, further comprising the step of expelling the remaining portion of the used gas into the atmosphere as an exhaust stream.

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8. A method as claimed in any one of claims 1 to 7, wherein the nitrogen is removed from the atmospheric air by means of a molecular sieve.

10 9. A method as claimed in any one of claims 1 to 7, wherein the nitrogen is removed from the atmospheric air by means of a membrane filtration system.

10. A method as claimed in any one of claims 1 to 7, wherein the
15 nitrogen is removed from the atmospheric air cryogenically.

11. A method as claimed in any one of claims 1 to 10, wherein the material to be dried is continuously fed through the dryer.

20 12. A method as claimed in claim 11, wherein the material to be dried is particulate matter which is held in suspension in the dryer and is intimately mixed with the drying gas.

13. A drying apparatus for drying material containing moisture,
25 comprising a supply of drying gas, which is atmospheric air from which at least a proportion of the nitrogen present therein has been removed, to thereby increase the percentage by volume of oxygen in the drying gas, said drying gas constituting a first stream of gas; a heater for heating the first stream of gas; a dryer operatively connected to the heater through
30 which the heated first stream of gas is passed for the purposes of removing moisture from said material; and a conduit for circulating a first portion of

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the used stream of gas, which constitutes a second stream of gas, back into the heater to be re-heated.

14. An apparatus as claimed in claim 13, wherein the first stream
5 of gas used to remove moisture from the material is atmospheric air having had at least 50% of the nitrogen normally present therein removed therefrom.

15. An apparatus as claimed in claims 13 or 14, wherein the first
10 stream of gas used to remove moisture from the material is atmospheric air having had a proportion of the nitrogen normally present therein removed therefrom such that the first stream of gas contains between 90% and 99% oxygen.

15 16. An apparatus as claimed in any one of claims 13, 14 or 15, further comprising an exhaust component for expelling the remaining portion of the used gas into the atmosphere as an exhaust stream.

17. An apparatus as claimed in any one of claims 13 to 16,
20 further comprising a fluid pump for ensuring movement of the gas stream and the used gas about the drying apparatus.

18. An apparatus as claimed in any one of claims 13 to 17 further comprising a heat recovery system for removing heat from a second
25 portion of the used stream of gas, which constitutes a third stream of gas, to form a fourth stream of gas.

19. An apparatus as claimed in claim 18, further comprising a gas cleaner for cleaning the fourth stream of gas.